Mathematics: Pure Mathematics 20
Grade: 10, 11, 12
Basic

WCP

Student and teacher: Use this cover sheet for mailing

ASSIGNMENT BOOKLET

MAT 2037 Pure Mathematics 20
Module 6

FOR STUDENT USE ONLY	
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Assigned Teacher: _____

Module Grading: _____

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Pure MATHEMATICS 20

Module 6

Coordinate Geometry and Trigonometry

Assignment Booklet

Learning Technologies Branch

Alberta LEARNING

FOR TEACHER'S USE ONLY

Summary

	Total Possible Marks	Your Mark
Section 1 Assignment	60	
Section 2 Assignment	30	
Final Module Assignment	10	
	100	

Teacher's Comments

This document is intended for	
Students	✓
Teachers	✓
Administrators	
Parents	
General Public	
Other	

Pure Mathematics 20
Assignment Booklet
Module 6
Coordinate Geometry and Trigonometry
Learning Technologies Branch
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ASSIGNMENT BOOKLET
PURE MATHEMATICS 20 – MODULE 6: COORDINATE GEOMETRY AND TRIGONOMETRY

Your mark on this module will be determined by how well you do your assignments in this booklet.

Work slowly and carefully. If you are having difficulties, go back and review the appropriate section.

There are two section assignments and one final module assignment in this Assignment Booklet. The total value of these assignments is 100 marks. The value of each assignment is stated in the left margin.

Be sure to proofread each assignment carefully.

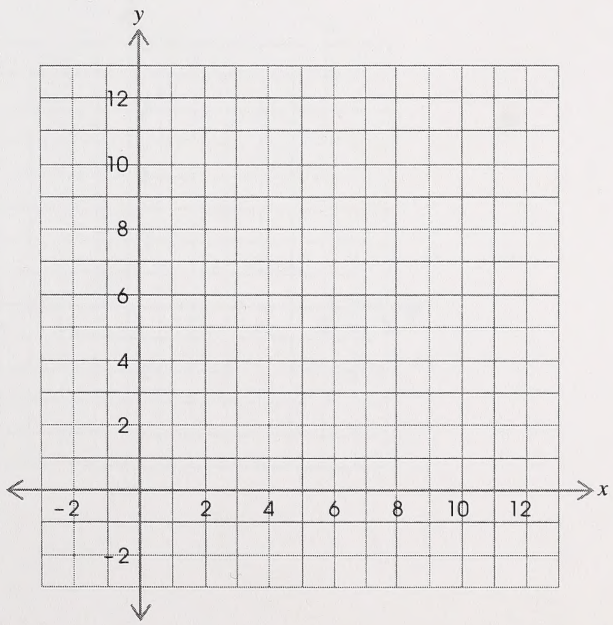
60

Section 1 Assignment: Coordinate Geometry

Read all parts of your assignment carefully and record your answers in the appropriate places. Clearly show how you arrived at your answers by showing your work.

1. The vertices of a rectangle are $A(1,4)$, $B(5,11)$, $C(10,10)$, and $D(11,2)$.

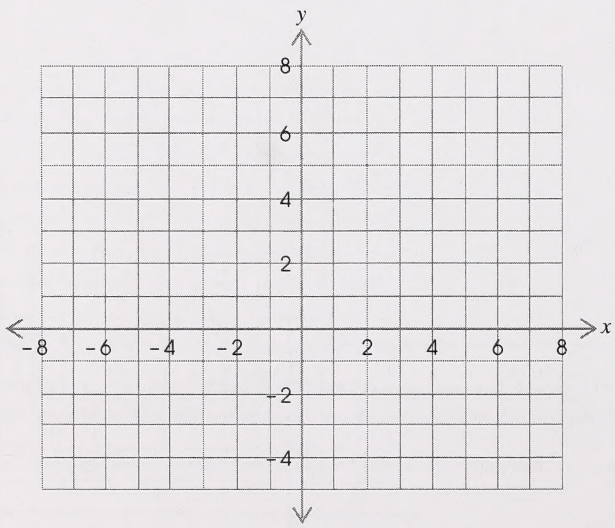
(1) **a.** Draw the rectangle.



(3) **b.** Prove that the diagonals intersect at right angles.

2. The vertices of a right triangle are $A(-3,1)$, $B(-3,7)$, and $C(5,1)$.

(1) **a.** Draw a diagram.



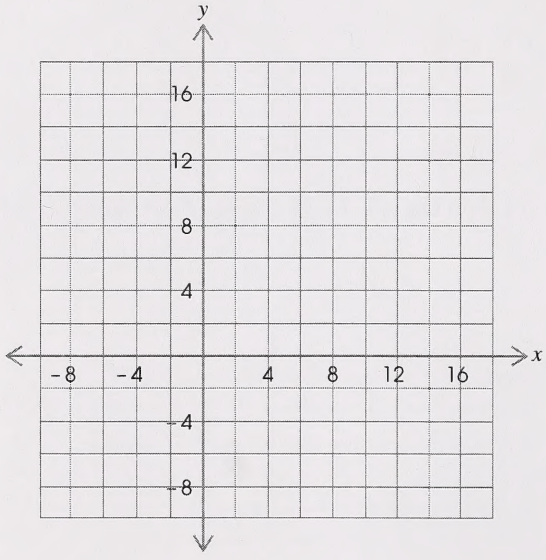
(2) **b.** Explain why ΔABC is a right triangle.

(4) **c.** Prove that the median, AM, from the right angle to the hypotenuse is one-half the length of the hypotenuse, BC.

(2) **d.** Determine the area of ΔACM in square units.

3. The vertices of a triangle are $A(13,13)$, $B(9,3)$, and $C(-1,-1)$.

(1) **a.** Draw a diagram.



(3) **b.** Determine the equation of the median AM, where M is the midpoint of BC.

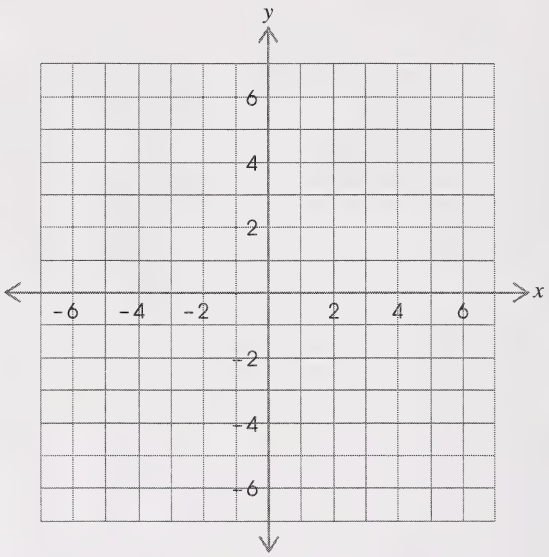
(3) **c.** Determine the equation of the median BN, where N is the midpoint of AC.

(3) **d.** Use the equations of AM and BN to determine the coordinates of P, the point of intersection of AM and BN.

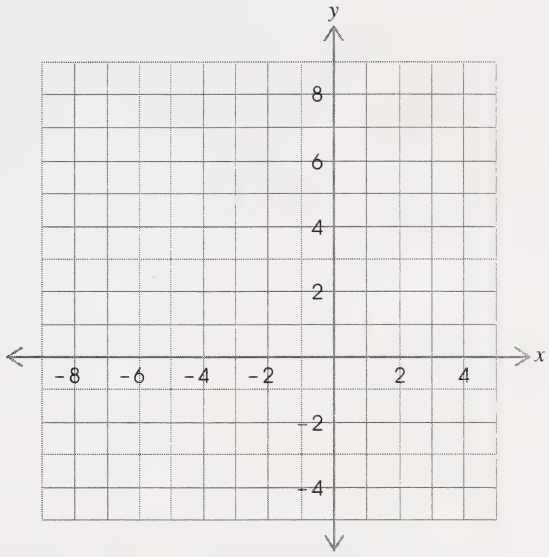
(3) **e.** Prove that the distance between P and M is one-third the length of median, AM.

(5)

4. Given $A(-1,3)$ and $B(4,5)$, determine the coordinates of the points that divide line segment AB into 3 congruent parts. Draw a graph to show your results.

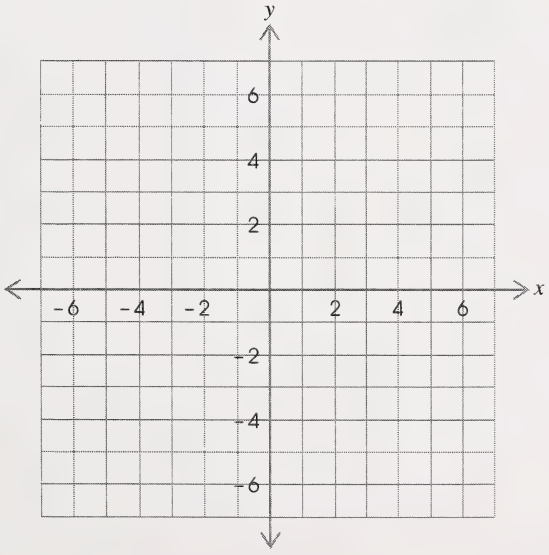


(3) **5.** Determine the equation of the circle with centre $C(-3,2)$ and passing through $P(2,3)$.



6. A circle with centre $C(-1,-2)$ is tangent to the line $3x+4y-14=0$.

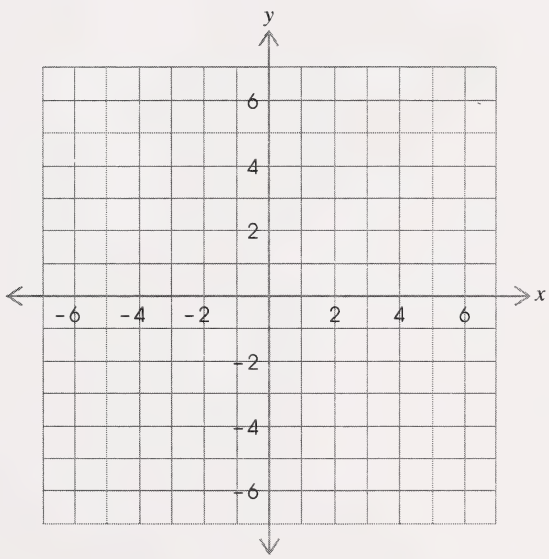
(2) **a.** Draw the diagram.



(6) **b.** Determine the radius of the circle algebraically.

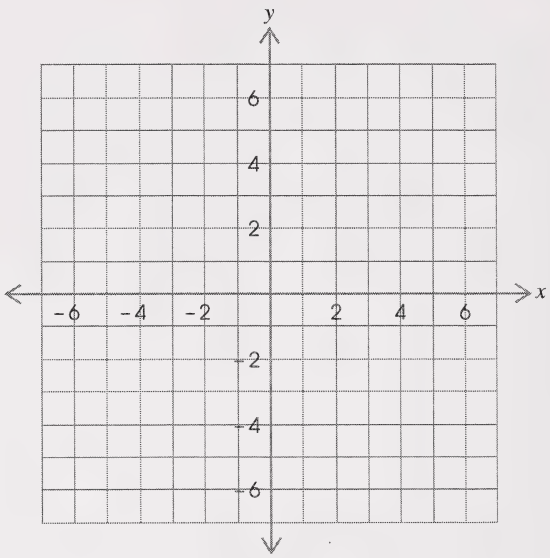
(2) **c.** Write the equation of this circle.

(6) **7.** Determine the diameter of the largest circle that can be drawn between the parallel lines $y = 2x$ and $y = 2x - 5$.



(5)

8. a. Find the points of intersection of the circle $x^2 + (y-1)^2 = 25$ and $y = -7x + 26$ by solving a system of equations.



(2) **b.** Find the length of the chord determined by the points of intersection in question 8.a. Express your answer in simplest radical form.

(3) **c.** Determine the distance of the chord from the centre of the circle.

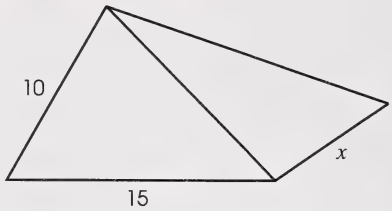
30

Section 2 Assignment: Trigonometry

Read all parts of your assignment carefully and record your answers in the appropriate places. Clearly show how you arrived at your answers by showing your work.

5

1. Determine the value of x. Round your answer to the nearest tenth.



(5)

2. A rocket was fired vertically upward. The angle of elevation to the top of the flight was measured from two points at ground level and 30 m apart. The points were on the same side of the launch site and in line with it. If the angles of elevation were 70° and 65°, what was the height of the rocket? Round your answer to the nearest metre.

(3)

3. In ΔABC, $\angle A = 30°$, and side $b = 5$ cm. What is the least possible value of a? What kind of triangle would ΔABC be?

(3)

4. a. Sarah was asked to construct ΔABC using $\angle B = 45°$, $a = 8$ cm, and the length of side b. Sarah observed that two triangles could be drawn. What are the possible values of b? Express your answers as exact values.

(4)

b. Select one of these values of b, and draw an accurate diagram clearly showing the two possible triangles.

(2)

5. a. In ΔABC, $\angle C = 20°$, $b = 10$ cm, and $c = 7$ cm. Explain why two triangles are possible using this information.

(8) **b.** Solve each possible triangle from question 5.a. Round angles to the nearest tenth of a degree and the side lengths to the nearest tenth of a centimetre.

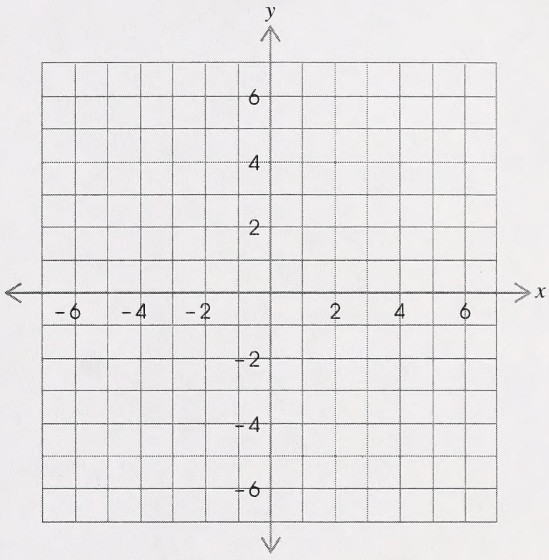
10

Final Module Assignment

Read all parts of your assignment carefully and record your answers in the appropriate places. Clearly show how you arrived at your answers by showing your work.

3

1. a. Determine points A and B, the points of intersection of the circle $x^2 + y^2 = 25$ and the line $y = 3$. Draw a diagram.

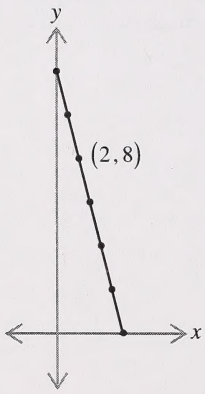


(3)

b. Use the Cosine Law to find the measure of the central angle subtended by chord AB. Express your answer to the nearest tenth.

(4)

2. A cross section of a ladder with 5 equally spaced rungs is drawn on a coordinate grid. The coordinates of the second rung from the top are $(2, 8)$. What are the coordinates of the ends of the ladder?



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